Fields of Opportunities

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
CHUCK GIPP, DIRECTOR

Permit Rationale

Date: July 8, 2013

Permit Writer: Brandy Beavers

Facility Name: City of Dubuque

Location:
County: Dubuque
Latitude: 42 degrees 28 minutes 10 seconds
Longitude: 90 degrees 39 minutes 35 seconds

Region/FO: 1, Manchester

Design: Discharge to Mississippi River:
Date upgraded: 2010
Flow: AWW: 13.47 MGD, ADW: 9.14 MGD, MWW: 24.50 MGD
BOD5: 41,200 lbs/day, P.E. 246,706.6
TKN: 6,700 lbs/day
TSS: 37,100 lbs/day
Source: Construction Permit 2010-0241 S dated April 5, 2010 &
Approved Facility Plan dated January 14, 2009

Treatment Plant Description: A pure O_2 activated sludge wastewater treatment system. The facility is in the process of a plant upgrade that is to be complete in 2014. The final upgrades to the plant will consist of two influent magmeters (one per influent line), two mechanical cleaned bar screens with a manual by-pass screen, two screenings washer/compactors, two grit classifiers, four primary clarifiers, flow equalization basins (conversion of the existing unused trickling filter), three pure oxygen aeration basins, four final clarifiers, a UV disinfection system (two trains), two WAS tanks, four 70' diameter anaerobic digestion tanks, two digested sludge centrifuges, rotary drum thickeners, and step aeration. The wastewater treatment facility receives primarily domestic and industrial waste from the City of Dubuque and surrounding areas.

Wasteload Allocation (WLA): See attached WLA calculated March 18, 2013 (Updated July 8, 2012).

Antidegradation: The discharge is to the Mississippi River. The facility plan for the upgrade to this treatment facility was approved on January 14, 2009. Iowa's Antidegradation Implementation Procedure became effective on September 30, 2010. Based on the Departments guidance, retroactive application of the antidegradation policy is prohibited; therefore the tier II antidegradation review is not required.

Impaired Waterbody: The Mississippi River is listed on Iowa's 2010 Impaired Waters List (303(d) list) due to several impairments. The downstream impairments include: aluminum, arsenic, bacteria, cadmium and mercury. The TMDLs for the above mentioned impairments have not been completed at this time. If, at the time a TMDL is completed, it is determined this discharge contributes to the impairment and the limits in the TMDL are more stringent than the permit, the permit may be modified to reflect the requirements of the TMDL.

Final Limits:

Parameter	Season	7-day ave mg/l	30-day ave mg/L	daily max mg/L	7-day ave lbs/day	30-day ave lbs/day	daily max lbs/day	Min	Max
CBOD	Yearly	40	25	---	4494	2808	---	---	---
TSS	Yearly	45	30	---	5055	3370	---	---	---
Ammonia (NH_3)	As specified in the WLA dated March 18, 2013.								
pH	Yearly	---	---	---	---	---	---	6.0	9.0
E. coli (geo-mean)	Summer	---	126	---	---	---	---	---	---
Mercury	Yearly	---	0.0103	0.01187	---	0.7904	0.9641	---	---

Basis for limits: $CBOD_5$ limits are based on secondary treatment standards and the design of the POTW.

TSS limits are based on secondary treatment standards and the design of the POTW.

PH limits are based on the secondary treatment standards.

The *E. coli* limit is based on WQBELs as detailed in the WLA dated March 18, 2013.

The total dissolved solids (TDS) and chloride sample results submitted with the application were 532 mg/L and 157 mg/L, respectively. As of November 11, 2009, the Department adopted chloride and sulfate water quality standards (WQS). The sample results for chloride that were provided in the application are below the water quality based effluent limit necessary to protect the receiving streams (see WLA dated March 18, 2013). Although no sulfate data is available, sulfate is a portion of the TDS and the TDS value provided is below the sulfate WQS, therefore, no effluent limitations or additional monitoring is proposed for sulfate or chloride.

The facility was required to submit test results for ammonia nitrogen, total residual chlorine (TRC), dissolved oxygen (DO), nitrate+nitrite as nitrogen, phosphorus, oil and grease, and Total Kjeldahl Nitrogen (TKN).

An average of 19.0 mg/L of Ammonia (as N) was detected in the effluent sample. The previous permit also included monitoring for Ammonia (as N). The data from January 2010 to February 2013 was analyzed and it was found that there is a reasonable potential (effluent sample results of at least ½ the WQBEL) to violate the WQBELs (see WLA dated March 18, 2013) during the months of May, June, July, August and November. Monitoring and limits are included in the proposed permit to ensure the facility adequately treats for Ammonia (as N).

At the time that this facility submitted the renewal application the facility used chlorination/dechlorination for disinfection proposed. The effluent sample result of 0.200 mg/L is below the WQBEL as stated in the WLA (dated March 18, 2013). The facility has recently upgraded the wastewater treatment facility to include UV disinfection and abandon the chlorination/dechlorination system therefore chlorine is no longer used and TRC monitoring and limits are not necessary.

The DO sample results from the application were a maximum concentration of 5.9 mg/L and an average concentration of 2.4 mg/L. Different combinations of effluent CBOD5/Ammonia nitrogen/total DO could have the same impact on the receiving stream DO level. Since the maximum CBOD5 level is capped by the technology based limit, the ammonia nitrogen and DO limits can be adjusted simultaneously in some degree and not cause the receiving stream DO level below 5.0 mg/l. If the facility does not violate the ammonia nitrogen limits from the WLA the receiving stream DO will not be lower than 5.0 mg/L therefore no minimum DO limit is proposed in the permit.

The WQS for nitrate + nitrate as nitrogen only applies to Class "C" waters. The Mississippi River is not a Class "C" water therefore no reasonable potential to violate the WQS exists. However, Total Nitrogen (which includes nitrate + nitrite as nitrogen) influent and effluent monitoring is included in the proposed permit as part of the State's nutrient reduction strategy.

<5.11 mg/L of oil and grease was reported in the application. In most cases, if oil and grease is less than 10 mg/L no visible sheen is present, therefore the facility meets the States narrative standard for oil and grease and no monitoring or limits are included in the proposed permit.

The phosphorus and TKN sample results were 2.74 mg/L and 18.5 mg/L respectively. The State does not currently have a WQS for phosphorus or TKN. Phosphorus and TKN influent monitoring and phosphorus final effluent monitoring is included in the proposed permit.

Effluent sample results for Mercury that were included in part B of the renewal application were non detections. Due to the history of this facility and the mercury that was known to be present in the treatment facility prior to the upgrade, and the mercury impairment of the Mississippi River, monitoring and limits are included in the proposed permit to ensure that the mercury has been properly disposed of and there is no residual issue in the treatment facility.

The data submitted with part B of the renewal application showed that the City of Dubuque does have levels of zinc and chloroform in its discharge. The sample results for both parameters were less than WQBELs and the Department does not feel that there is a reasonable potential for this facility to violate the WQS for these parameters. Therefore, no limits or monitoring are included in the proposed permit for zinc or chloroform.

The effluent sample results included in part B for Selenium and Thallium were both non detections; however the reporting level that these parameters were sampled to were higher than the WQS. These pollutants are a concern to the Department due to their potential toxicity. Monitoring is included in the proposed permit to ensure the levels present do not violate the WQS of the receiving stream. The monitoring frequency is based on the Supporting Document for Permit Monitoring Frequency Determination. If the facility submits effluent sample results at a lower detection level, as required in the permit application, prior to the issuance of the final permit, the monitoring requirements may be modified or removed if no reasonable potential exists.

The facility also failed to report effluent sample results for Methyl Chloride as required by part B of the renewal application. The facility is aware these sample results are necessary to complete the application. Effluent monitoring is included in the permit to ensure the discharge does not have negative impact of the receiving stream. The sample frequency is set equal to the monitoring frequency of Selenium and Thallium. If the facility submits the required effluent sample results to complete their application prior to issuance of the final permit, the monitoring requirement may be modified or removed if no reasonable potential exists.

Backsliding/Anti-Backsliding: All parameters in the proposed permit are identical or more stringent than the limits in the previous permit, therefore backsliding is not occurring.

Effluent toxicity: The Department is incorporating acute toxicity limits and testing into the permit as per IAC 567-63.4. The dilution percentages for effluent toxicity testing specified in the WLA are: 13.8% of the effluent and 86.2% of dilution water for the acute WET test. An annual monitoring frequency is specified in the permit.

Monitoring Basis: Compliance and operational monitoring are based on Chapter 63 IAC, Tables II and III, Category >105,000, the Supporting Document for Permit Monitoring Frequency Determination and Best Professional Judgement based on the equivalent of the monitoring frequencies of other parameters. Acute WET test requirements are based on IAC 567- 63.4(1).

Parameter	Pollutant Group	Violation Potential	Effluent Flow vs. Stream Flow	Monitoring Frequency
Total Mercury	5	5	1	1 time per week
Total Selenium	5	5	1	1 time per week
Total Thallium	5	5	1	1 time per week

The monitoring frequency for mercury was adjusted to two per month based on BPJ. The two samples per month is sufficient to ensure there is no impact on the impaired portion of the Mississippi River. If the sample results submitted indicate that mercury is in fact being discharged from this facility the permit may be reopened and monitoring and limits may be added.

Special Monitoring: Thallium, Selenium, Ammonia – Nitrogen and *E.coli* sampling requirements are specified on the Special Monitoring Requirements page of the permit.

Sludge: Sludge must be land applied according to Chapter 67 IAC land application rules or otherwise disposed of in accordance with the Federal regulations in 40 CFR 503. No adverse environmental or public health impacts have been identified.

Compliance Schedule: None.

Pretreatment: The City's Pretreatment Program was approved on September 29, 1983. On December 11, 2012 Sue Miller, DNR FO #1, conducted an inspection of the program. Ms. Miller concluded that the City must determine the compliance status of all of its industrial users for 2012 and submit a status report. As of April 5, 2013 a full report has yet to be submitted to the Department.

In 2007, Paul Marshall, USEPA Region 7, reviewed the local limits for this facility. All local limits were considered ok with the exception of phenolics and toluene. There is a human health concern with these two pollutants. The Department never issued an approval of these local limits based on the concerns from USEPA. In 2007 there was joint enforcement efforts taking place (with the State and EPA) as well as the City working to get a new pretreatment coordinator. During this time there was the intention to address the local limits but it does not appear that anything was done. This permit proposes that the City shall evaluate the adequacy of its local limits to meet the general prohibitions against interference and pass through listed in 40 CFR 403.5(a) and the specific prohibitions listed in 40 CFR 403.5(b). The evaluation requirements are listed on the major contributing industries limitations, monitoring, and reporting requirements page of this permit.

The permit also proposes that the City evaluate the approved pretreatment program to evaluate compliance with the general pretreatment regulation in 40 CFR 403 and the state's pretreatment rules in IAC 567 – 62, specifically with regards to the pretreatment streamlining rule published in the Federal Register on October 14, 2005. The City shall submit a report detailing the evaluation and proposing modifications as necessary to address any deficiencies that are identified. The report requirements are listed on the major contributing industries limitations, monitoring, and reporting requirements page of this permit.

Administrative Order: None.

Comments: The permit contains a requirement for the City to conduct a two year feasibility study to determine the facility's ability to remove nutrients (total nitrogen and total phosphorus). The requirement is in based on the 2013 Iowa Nutrient Reduction Strategy. The facility is required to evaluate the feasibility and reasonableness of reducing the amounts of nitrogen and phosphorus discharged into surface water.